

REMARKS

The Office Action dated February 12, 2009 has been given careful consideration by the applicants. Reconsideration of the application is hereby respectfully requested. Claims 1-39 remain in the application.

The Office Action

The Examiner rejected claims 1, 8-9, 21-22 and 26-29 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,346,704 to Kenway in view of U.S. Patent No. 4,814,870 to Crall.

The Examiner rejected claims 2 and 3 under 35 U.S.C. §103(a) as being unpatentable over Kenway in view of Crall and further in view of U.S. Patent No. 6,353,197 to Ulrichsen.

The Examiner rejected claims 4-7 under 35 U.S.C. §103(a) as being unpatentable over Kenway in view of Crall and further in view of U.S. Patent No. 5,936,353 to Triner.

The Examiner rejected claims 10-12 as being unpatentable over Kenway in view of Crall and further in view of U.S. Application No. 2004/0003680 to Wasmund.

The Examiner rejected 13-17 under 35 U.S.C. §103(a) as being unpatentable over Kenway in view of Crall and further in view of U.S. Patent No. 4,704,660 to Robbins.

The Examiner rejected claims 13 and 18-20 under 35 U.S.C. §103(a) as being unpatentable over Kenway in view of Crall and further in view of U.S. Patent No. 5,814,840 to Woodall.

The Examiner rejected claims 23-25 under 35 U.S.C. §103(a) as being unpatentable over Kenway in view of Crall and further in view of U.S. Publication No. 2003/0222002 to Meyer.

The Examiner rejected claims 30 and 32-39 under 35 U.S.C. §103(a) as being unpatentable over U.S. Publication No. 2002/0089561 to Weitzel in view of Crall.

The Examiner rejected claim 31 under 35 U.S.C. §103(a) as being unpatentable over Weitzel in view of Crall and further in view of Ulrichsen.

The Claims are Allowable

The Examiner rejected independent claim 1 based on Kenway and Crall. In the rejection, the Examiner states that Kenway does not include a lead-salt based thermal infrared imager supporting snapshot action thermal imaging. We accept the position of the Examiner on this point.

However, the Examiner argues that it would have been obvious to use the lead-salt based scanner described in Crall. We disagree with the Examiner on this point.

In this regard, as previously argued, the specification itself, at pages 1-4, describes the deficiencies of known imaging techniques, including infrared imaging techniques that are described in Kenway. Kenway states that the typical IR scanner would use cooled systems or microbolometers (col. 1, lines 51-54). These are precisely the type of imagers that the present application identifies as insufficient. So, it is submitted that Kenway teaches away from the use of a lead-salt imager as contemplated by the present application. The Examiner does not address this issue in the Office Action.

Further, for some types of infrared imaging, the disadvantages are cost and lack of ruggedness. For other types of infrared imagers, the disadvantages are lack of functionality and responsiveness on a pixel basis. These problems were not easily solved in the field until the applicants' invention. And, the cited portions of Crall – which relate to a portable infrared imager - do not suggest the use of the imager in an automated process control inspection environment as contemplated by the present application.

According to the applicants' invention, the use of a lead salt-based imager solves the above problems with the prior techniques. The lead salt based imagers can be implemented without the cost of prior systems that required complex cooling systems and have adequate responsiveness on a pixel level to allow for snapshot mode of operation in a machine vision environment. This feature, a lead salt based thermal infrared imager supporting snap shot mode of operation in an automated process control inspection environment, is clearly recited in claim 1. Therefore, this claim, and all claims dependent thereon (claims 2-29), should be allowed.

The Examiner states that combining Kenway and Crall as suggested is a

substitution of one known element for another, yielding predictable results. However, the above arguments demonstrate that using a lead salt imager is not a mere substitution, as suggested. It was the applicants who identified the benefits and results in use of a lead salt imager as claimed. The claimed invention would not have been apparent to others of skill in the art.

In addition, the Examiner rejected claims 26 and 29 in view of Kenway. However, the Examiner's rejection should be withdrawn inasmuch as there is no indication in the cited portions of Kenway that any marking occurs as a result of parts being below or above a predetermined quality level or that closed loop control of a manufacturing process is occurring. The Examiner does not address this argument in the Office Action.

Also, in the various rejections based on combinations of Kenway, Crall and other patents, the Examiner has not established that any of the other cited patents cure the deficiencies of Kenway and Crall. Therefore, all claims are submitted to be allowable for at least these reasons.

The Examiner rejected claims 2-3 based on Kenway, Crall and Ulrichsen. The Examiner asserts that Ulrichsen shows a belt conveyor for inspecting matter of varying composition. However, the Examiner has not established that it would have been obvious to combine a belt conveyor for such relatively small and random objects with inspection systems of Kenway and Crall which purportedly relate to inspection of large panels and the like. The Examiner does not address this argument in the Office Action. Therefore, it is submitted that the rejection fails.

Claims 4-7 were rejected as being unpatentable over Kenway, Crall and Triner. The Examiner argues that Triner discloses a baffle to shield the imager from deleterious thermal energy. However, the cited portion of Triner relates to a heat sink which allows LEDs to cool. The Examiner does not address this argument in the Office Action. Therefore, the Examiner's rejection fails.

The Examiner rejected claims 10-12 as being unpatentable over Kenway, Crall and Wasmund. However, Wasmund has a filing date of July 3, 2002. The priority date on the present application is May 21, 2001. The Examiner does not address this argument in the Office Action. Therefore, the rejection should be removed.

The Examiner rejected claims 13-17 as being unpatentable over Kenway, Crall and Robbins. However, the Examiner still has not established that Robbins is in any way combinable with the combination.

The Examiner rejected claims 13 and 18-20 as being unpatentable over Kenway, Crall and Woodall. However, the Examiner still has not established in any way how or why the teachings of Woodall would be combined with the combination. Therefore, the rejection should be removed.

The Examiner rejected claims 23-25 as being unpatentable over Kenway, Crall and Meyer. The Examiner's rejection fails, however, because the Examiner does not indicate that the deficiencies of the suggested Kenway/Crall combination are cured by Meyer.

The Examiner rejected claims 30 and 32-39 as being unpatentable over Weitzel in view of Crall. However, as will be detailed below, Weitzel and Crall are not fairly combinable.

In this regard, Weitzel relates to the use of an optical fiber to bring visual information to a camera or various types of instruments from a printhead as a printhead is printing products. Weitzel indicates that coherent optical fibers offer the ability to view an actual picture of a process such as drop generation, while requiring minimal space near the drop generator. Optical fibers permit the observing end of the fiber to move relative to the receiving end while observations are being taken. As noted above, Crall relates to a portable infrared imager – which does not suggest the use of the imager in an automated process control inspection environment as contemplated by the present application.

It is submitted that this suggested combination fails for a number of reasons. First, the Examiner does not establish that there would be any reason to combine a portable infrared imager with a process for imaging droplets being ejected by a printhead. Indeed, Weitzel itself indicates that only minimal space is available near the drop generator to obtain images – and the Examiner fails to establish how the fiber optic system of Weitzel would be adapted to an infrared imager of the type described in Crall. It is submitted that this is not a mere substitution of one element for another. Second, for the reasons detailed above relative to the suggested combination of Crall

and Kenway, even if one were to attempt to combine a lead salt infrared imager in another imaging system, such a combination would not be obvious. For essentially the same reasons as noted above, implementation of a lead salt imager over other imagers would not be apparent to those of skill in the art. It was the applicants who recognized the advantages of lead salt imagers in the claimed environments to address the problems discussed above and noted in the specification.

Therefore, independent claims 30 and 36 are submitted to be allowable. Likewise, all claims dependent thereon are submitted to be allowable.

The Examiner rejected claim 31 as being unpatentable over Weitzel in view of Crall and further in view of Ulrichsen. However, the Examiner has not established that Ulrichsen cures the deficiencies of the suggested Weitzel and Crall combination. Therefore, claim 31 is likewise allowable.

CONCLUSION

For the reasons detailed above, it is respectfully submitted all claims remaining in the application (Claims 1-39) are now in condition for allowance.

Respectfully submitted,

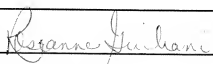
Fay Sharpe LLP



Joseph D. Dreher, Reg. No. 37,123
The Halle Building, 5th Floor
1228 Euclid Avenue
Cleveland, Ohio 44115-1843
216.363.9000

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Date

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